The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A system for communicating encoded signals to control a device for performing work related to yarding operations, comprising:

a transmitter for transmitting an encoded signal having at least two digital portions, a first portion of the at least two digital portions being defined as a preamble, a second portion of the at least two digital portions being defined as an action code; and

a receiver for receiving the encoded signal to produce a controlling signal, the receiver being activated to process the action code to produce the controlling signal, thereby controlling the device for performing work related to yarding operations, when the preamble is of a predetermined pattern.

2. The system of Claim 1, wherein the transmitter includes a first piece of static memory for storing a source node identifier and a destination node identifier, the transmitter transmitting the encoded signal having a third portion being defined as a network identifier, the network identifier containing the source node identifier and the destination node identifier, the receiver including a second piece of static memory for storing a predetermined destination node identifier and being programmed to recognize a set of source node identifiers, the receiver being activated to discard the encoded signal when either the source node identifier is not a member of the set of source node identifiers or the destination node identifier is different from the predetermined destination node identifier, thereby inhibiting unauthorized signals from controlling the device for performing work related to yarding operations.

3. The system of Claim 2, wherein the transmitter includes a single-axis tilt detector for producing a first quantity that is indicative of the position of the transmitter along a horizontal plane and a second quantity that is indicative of the position of the transmitter along a vertical plane, the first quantity and the second quantity defining an orientation of the transmitter.

4. The system of Claim 3, wherein the transmitter includes a counter for counting a span of time in which the orientation of the transmitter does not change within

a predetermined period of time, thereby defining a duration that the transmitter has laid motionless.

5. The system of Claim 4, wherein the transmitter includes a third piece of static memory for storing a device identifier, the device identifier being a serial number that is unique to the transmitter.

6. The system of Claim 5, wherein the transmitter includes a battery having a level of energy, the battery for supplying power to operate the transmitter.

7. The system of Claim 6, wherein the transmitter includes a lost processor for running a piece of software that transmits a lost encoded signal being composed of multiple digital portions that can be decoded by a transceiver to find the transmitter if the transmitter is lost during yarding operations.

8. The system of Claim 7, wherein the lost encoded signal includes a first portion being defined as a lost preamble, the transceiver being adapted to discard the lost encoded signal when the lost preamble is different from a predetermined lost preamble.

9. The system of Claim 8, wherein the lost encoded signal includes a second portion being defined as a lost network identifier, the lost network identifier having the source node identifier and the destination node identifier, the transceiver being activated to discard the lost encoded signal when either the source node identifier is not a member of the set of source node identifiers or the destination node identifier is different from the predetermined destination node identifier, thereby inhibiting undesired signals from confusing the receiver in finding the transmitter that is lost.

10. The system of Claim 9, wherein the lost encoded signal includes a third portion that contains the device identifier, thereby allowing the transceiver to recognize the transmitter that is lost.

11. The system of Claim 10, wherein the lost encoded signal includes a fourth portion containing the first quantity that is indicative of the position of the transmitter along the horizontal plane and a seventh portion containing the second quantity that is indicative of the position of the transmitter along a vertical plane, thereby allowing the

transceiver to derive the orientation of the transmitter lying on the ground if the transmitter is lost.

12. The system of Claim 11, wherein the lost encoded signal includes a fifth portion containing the duration that the transmitter has laid motionless.

13. The system of Claim 12, wherein the lost encoded signal includes a sixth portion containing the level of the battery of the transmitter, the battery level being indicative of the remaining level of energy of the battery of the transmitter, thereby allowing the transceiver to calculate the remaining time the transmitter may operate.

14. The system of Claim 13, wherein the lost circuit of the transmitter is adapted to receive commands from the transceiver so as to aid the transceiver finding the transmitter if the transmitter is lost during yarding operations.

15. The system of Claim 1, wherein the transmitter includes an aural indicator that audibly provides information regarding a state of the transmitter so as to help confirm for a user that the transmitter has desirably responded to an action of the user or to help the user to locate the transmitter if the transmitter is lost.

16. The system of Claim 1, wherein the transmitter includes a scrambler that scrambles a portion of the encoded signal to improve the distribution of bits in the encoded signal, thereby enhancing the ability of the receiver to receive the encoded signal.

17. The system of Claim 2, wherein the receiver includes a recorder that records the encoded signal based upon the network identifier, thereby aiding in the determination of the sequence of yarding activities that lead to an accident relating to yarding operations.

18. The system of Claim 3, wherein the transmitter includes a microphone for receiving voice communication and transmitting the voice communication to the receiver, the voice communication being modulated via frequency modulation and being framed with a digital squelch code so as to inhibit false reception prior to transmitting the voice communication to the receiver.

19. The system of Claim 18, wherein the voice communication is transmitted and the transmission of the encoded signal is inhibited when the transmitter is in a first orientation, and wherein the encoded signal is transmitted and the transmission of the voice communication is inhibited when the transmitter is in a second orientation.

20. The system of Claim 6, wherein the transmitter includes an interface for receiving external power to charge the battery, the interface being adapted to receive programming signals to program the transmitter when external power is not presented at the interface to charge the battery.

21. A method for communicating encoded signals transmitted by a transmitter and received by a receiver to control a device for performing work related to yarding operations, comprising:

sleeping to conserve energy stored in a battery until the transmitter is awakened by a switch activation for transmitting an encoded signal to the receiver that contains at least two digital portions, a first portion of the at least two digital portions being defined as a preamble, a second portion of the at least two digital portions being defined as an action code; and

processing the action code by the receiver upon receiving the at least two digital portions to produce a controlling signal, thereby controlling the device for performing work related to yarding operations, when the preamble is of a predetermined pattern.

22. The method of Claim 21, wherein the act of transmitting includes transmitting a third portion being defined as a network identifier, the network identifier containing a source node identifier and a destination node identifier, the receiver being programmed to recognize a predetermined destination node identifier and a set of source node identifiers, the act of receiving including discarding the encoded signal when either the source node identifier is not a member of the set of source node identifiers or the destination node identifier is different from the predetermined destination node identifier, thereby inhibiting unauthorized signals from controlling the device for performing work related to yarding operations.

23. The method of Claim 21, wherein sleeping to conserve energy stored in the battery until the transmitter is awakened by a scheduled task to check a state of a

programming interface of the transmitter is defined as an active state, the transmitter changing from the active state to a program state when a programming signal is sensed by the transmitter on a programming pin of the transmitter, the transmitter being receptive to programming instructions when the transmitter is in the program state.

24. The method of Claim 21, wherein sleeping to conserve energy stored in the battery until the transmitter is awakened by a scheduled task to check the level of the battery, the transmitter outputting an audible signal when the level of the battery has been reduced to a predetermined low threshold value.

25. The method of Claim 21, wherein sleeping to conserve energy stored in the battery until the transmitter is awakened to perform a scheduled task is defined as an active state, the scheduled task including checking an orientation of the transmitter.

26. The method of Claim 25, wherein the transmitter changes from the active state to a storage state when the act of checking the orientation of the transmitter determines that the transmitter is oriented vertically and that the transmitter is motionless, thereby indicating that the transmitter is fitted into a charging unit to charge the battery.

27. The method of Claim 26, wherein the transmitter changes from the active state to a dropped state when the act of checking the orientation of the transmitter determines that the transmitter is not oriented vertically and that the transmitter is motionless, thereby indicating that the transmitter has been inadvertently dropped on the ground.

28. The method of Claim 27, wherein the transmitter changes from the dropped state to an alert state after a duration of time has expired, the transmitter outputting an alert signal, the alert signal being selected from a group consisting of aural alert signals, radio frequency alert signals, and voice alert signals, the aural alert signals being adapted to be audible, the radio frequency alert signals being a package of multiple digital portions, and the voice alert signals being voice communication picked up by an enabled microphone of the transmitter for transmission to a transceiver, thereby aiding to locate the transmitter when the transmitter is lost.

29. The method of Claim 25, wherein the transmitter transmits voice communication to the receiver when a switch is actuated on the transmitter, the transmitter is oriented vertically, and the transmitter is in the active state.

30. The method of Claim 29, wherein the transmitter ceases the transmission of voice communication to the receiver after a period of time, voice communication being reestablished by the transmitter when the switch is actuated again on the transmitter, the transmitter is oriented vertically, and the transmitter is still in the active state.

31. A transmitter for transmitting encoded signals to a receiver to control an aural signaling device for forewarning of impending changes in operations of yarding machinery, the transmitter comprising:

a first component for responding to a switch actuation to output an encoded signal having at least three digital portions, a first portion being defined as a preamble, a second portion being defined as a network identifier, and a third portion being defined as an action code, the network identifier being processed by the receiver when the preamble is of a predetermined pattern, the action code being processed by the receiver to control the aural signaling device when the network identifier is recognized by the receiver, thereby inhibiting signals with unrecognized network identifiers from controlling the aural signaling device;

a frequency synthesizer for producing the encoded signal at a radio frequency for transmission by varying the frequency of the encoded signal; and

an antenna for radiating the encoded signal so that the receiver may receive the encoded signal to control the aural signaling device.

32. The transmitter of Claim 31, wherein the frequency synthesizer includes a reference crystal oscillator for generating a reference frequency, the crystal oscillator being receptive to the data signal for modulating the reference frequency so as to produce a modulated encoded signal.

33. The transmitter of Claim 32, wherein the frequency synthesizer includes a voltage-controlled oscillator for oscillating the encoded signal to produce an oscillated encoded signal for the antenna to radiate, the voltage-controlled oscillator being receptive

to a filtered voltage signal for adjusting the frequency by which the voltage-controlled oscillator oscillates the encoded signal.

34. The transmitter of Claim 33, wherein the frequency synthesizer includes a second component for multiplying the reference frequency with the oscillated encoded signal so as to produce the voltage signal having a magnitude and sign that are proportional to the phase difference between the reference frequency and the oscillated encoded signal, the second component being receptive to a phase-locked loop programming signal to change the frequency of the oscillated encoded signal by a sub-multiple of the reference frequency, thereby shifting from one channel to another channel for communication.

35. The transmitter of Claim 34, wherein the frequency synthesizer includes a loop filter to low-pass filter the voltage signal to produce the filtered voltage signal being used by the voltage-controlled oscillator to adjust the frequency by which the voltage-controlled oscillator oscillates the encoded signal.

36. The transmitter of Claim 35, further comprising a radio-frequency power amplifier for amplifying the oscillated encoded signal coming from the frequency synthesizer to produce an amplified encoded signal when a transmitter power control signal turns on the radio-frequency power amplifier, thereby inhibiting undesired transmissions.

37. The transmitter of Claim 36, further comprising a harmonic cleansing filter for low-pass filtering the amplified encoded signal to produce a cleansed encoded signal, thereby attenuating the harmonics associated with the amplified encoded signal.

38. The transmitter of Claim 37, wherein the frequency synthesizer is receptive to a transmitter standby control signal, the frequency synthesizer being deactivated when the transmitter standby control signal is at a first predetermined level and being activated when the transmitter standby control signal is at a second predetermined level, thereby conserving the energy of a battery of the transmitter.

39. The transmitter of Claim 36, further comprising a finder receiver for receiving a finder signal from the antenna at a predetermined frequency so that the transmitter may respond to the finder signal and perform a task to aid in it being found when the transmitter is lost.

40. The transmitter of Claim 39, further comprising a high-pass filter coupled between the antenna and the receiver, the high-pass filter being adapted to pass the finder signal to the finder receiver while inhibiting the cleansed encoded signal from entering the finder receiver.

41. A transmitter for transmitting encoded signals to a receiver to control a motorized carriage for transporting logs from a remote location to a yarder, the transmitter comprising:

a first component for responding to a combination of switch actuations to output an encoded signal having at least three digital portions, a first portion being defined as a preamble, a second portion being defined as a network identifier, and a third portion being defined as an action code, the network identifier being processed by the receiver when the preamble is of a predetermined pattern, and the action code being processed by the receiver to control the motorized carriage when the network identifier is recognized by the receiver, thereby inhibiting signals with unrecognized network identifiers from controlling the motorized carriage;

a frequency synthesizer for modulating the encoded signal onto a radio frequency carrier for transmission; and

an antenna for radiating the encoded signal so that the receiver may receive the encoded signal to control the motorized carriage.

42. The transmitter of Claim 41, further comprising a finder receiver for receiving a finder signal from the antenna at a predetermined frequency so that the transmitter may respond to the finder signal and perform a task to aid in it being found when the transmitter is lost.

43. The transmitter of Claim 42, further comprising a high-pass filter coupled between the antenna and the receiver, the high-pass filter being adapted to pass the finder

signal to the finder receiver while inhibiting the cleansed encoded signal from entering the finder receiver.

44. A receiver for receiving encoded signals from a transmitter to control an aural signaling device for forewarning of impending changes in operations of yarding machinery, the receiver comprising:

a radio-frequency circuit for receiving at least one of two signals, one of the two signals being a modulated voice signal and the other being a modulated encoded signal that is composed of at least three digital portions, a first portion being defined as a preamble, a second portion being defined as a network identifier, and a third portion being defined as an action code;

a controller circuit for processing the network identifier when the preamble is of a predetermined pattern and for processing the action code to control the aural signaling device when the network identifier is a member of a set of network identifiers that are recognized by the controller circuit, thereby inhibiting signals with unrecognized network identifiers from controlling the aural signaling device; and

a relay circuit for processing the action code to control other pieces of yarding machinery equipment.

45. The receiver of Claim 44, wherein the radio-frequency circuit includes a front end stage for receiving the at least one of two signals, the front end stage including:

a first radio frequency filter for bandpass filtering the at least one of two signals to produce a first filtered signal;

a radio frequency amplifier for amplifying the first filtered signal to produce a first amplified signal; and

a second radio frequency filter for band pass filtering the first amplified encoded signal to produce a second filtered signal.

46. The receiver of Claim 45, wherein the radio-frequency circuit includes a splitter to split the second filtered signal to produce a split signal being sent into two paths, the two paths being a voice path and a data path.

47. The receiver of Claim 46, wherein the radio-frequency circuit includes two down converters to shift the frequency of the split signal to produce a down-converted

signal so as to progressively amplify and isolate the modulated signal, one of the down converters being adapted to produce the down-converted signal in the voice path and the other of the down converters being adapted to produce the down-converted signal in the data path.

48. The receiver of Claim 47, wherein the radio-frequency circuit includes two intermediate frequency strip stages to cleanse the down-converted signal and produce a strip signal, one of the intermediate frequency strip stages being adapted to produce the strip signal in the voice path and the other of the intermediate frequency strip stages being adapted to produce the strip signal in the data path, each intermediate frequency strip stage including:

a four-pole filter for bandpass filtering the down-converted signal to produce a third filtered signal; and

an intermediate frequency amplifier for amplifying the third filtered signal to produce a second amplified signal.

49. The receiver of Claim 48, wherein the radio-frequency circuit includes two receiving stages for demodulating the second amplified signal, each receiving stages including a six-pole filter to bandpass filter the second amplified signal prior to demodulation, one of the receiving stages being adapted to produce a demodulated voice signal in the voice path and the other receiving stage being adapted to produce a demodulated encoded signal in the data path.

50. The receiver of Claim 49, wherein the demodulated voice signal includes two components, wherein the radio-frequency circuit includes a lowpass filter for filtering one of the two components of the demodulated voice signal to produce a fourth filtered signal, the fourth filtered signal being applied to a Schmitt trigger to produce a digital squelch code signal.

51. The receiver of Claim 50, wherein the radio-frequency circuit includes a deemphasis filter for filtering the other of the two components of the demodulated voice signal to produce a fifth filtered signal, the fifth filtered signal being applied to a lowpass filter to produce voice communication originated at the transmitter.

52. The receiver of Claim 49, wherein the radio-frequency circuit includes a Gaussian Minimum Shift Keying demodulator for receiving the demodulated data signal to produce the encoded signal.

53. A receiver for receiving encoded signals from a transmitter to control a motorized carriage for transporting logs from a remote location to a yarder, the receiver comprising:

a radio-frequency circuit for receiving at least one of two signals, one of the two signals being a modulated voice signal and the other being a modulated encoded signal that is composed of at least three digital portions, a first portion being defined as a preamble, a second portion being defined as a network identifier, and a third portion being defined as an action code; and

a controller circuit for processing the network identifier when the preamble is of a predetermined pattern and for processing the action code to control the motorized carriage when the network identifier is a member of a set of network identifiers that are recognized by the controller circuit, thereby inhibiting signals with unrecognized network identifiers from controlling the motorized carriage.

54. The receiver of Claim 53, wherein the radio-frequency circuit includes a front end stage for receiving the at least one of two signals, the front end stage including:

a first radio frequency filter for bandpass filtering the at least one of two signals to produce a first filtered signal;

a radio frequency amplifier for amplifying the first filtered signal to produce a first amplified signal; and

a second radio frequency filter for band pass filtering the first amplified encoded signal to produce a second filtered signal.

55. The receiver of Claim 54, wherein the radio-frequency circuit includes a splitter to split the second filtered signal to produce a split signal being sent into two paths, the two paths being a voice path and a data path.

56. The receiver of Claim 55, wherein the radio-frequency circuit includes two down converters to shift the frequency of the split signal to produce a down-converted signal so as to progressively amplify and isolate the modulated signal, one of the down

converters being adapted to produce the down-converted signal in the voice path and the other of the down converters being adapted to produce the down-converted signal in the data path.

57. The receiver of Claim 56, wherein the radio-frequency circuit includes two intermediate frequency strip stages to cleanse the down-converted signal and produce an intermediate signal, one of the intermediate frequency strip stages being adapted to produce the intermediate signal in the voice path and the other of the intermediate frequency strip stages being adapted to produce the intermediate signal in the data path, each intermediate frequency strip stage including

a four-pole filter for bandpass filtering the down-converted signal to produce a third filtered signal; and

an intermediate frequency amplifier for amplifying the third filtered signal to produce a second amplified signal.

58. The receiver of Claim 57, wherein the radio-frequency circuit includes two receiving stages for demodulating the second amplified signal, each receiving stages including a six-pole filter to bandpass filter the second amplified signal prior to demodulation, one of the receiving stages being adapted to produce a demodulated voice signal in the voice path and the other receiving stage being adapted to produce a demodulated encoded signal in the data path.

59. The receiver of Claim 58, wherein the demodulated voice signal includes two components, wherein the radio-frequency circuit includes a lowpass filter for filtering one of the two components of the demodulated voice signal to produce a fourth filtered signal, the fourth filtered signal being applied to a Schmitt trigger to produce a digital squelch code signal.

60. The receiver of Claim 59, wherein the radio-frequency circuit includes a deemphasis filter for filtering the other of the two components of the demodulated voice signal to produce a fifth filtered signal, the fifth filtered signal being applied to a lowpass filter to produce voice communication originated at the transmitter.

61. The receiver of Claim 58, wherein the radio-frequency circuit includes a Gaussian Minimum Shift Keying demodulator for receiving the demodulated data signal to produce the encoded signal.

62. An interface for recharging a battery of a transmitter and for programming the transmitter used to control a device for performing work related to yarding operations, the interface comprising:

an open chamber being recessed into the transmitter;

a first contact located within the open chamber and having a proximal end and a distal end, the proximal end of the first contact being coupled to a circuit for providing a ground reference to the transmitter, the distal end of the first contact being adapted to receive an external ground reference;

a second contact located within the open chamber and having a proximal end and a distal end, the proximal end of the second contact being coupled to a circuit for recharging a battery of the transmitter, the distal end of the first contact being adapted to receive an external power signal; and

a third contact located within the open chamber and having a proximal end and a distal end, the proximal end of the third contact being coupled to a programming circuit for reprogramming the transmitter, the distal end of the third contact being adapted to receive an external programming signal.

63. A signal for carrying information to control a device for performing work related to yarding operations, the signal being transmitted by a transmitter and being received by a receiver, the signal comprising:

a first digital portion being defined as a preamble that contains a bit pattern;

a second digital portion being defined as a network identifier that has a source identifier and a destination identifier, the network identifier being processible by the receiver if the bit pattern of the preamble is as expected by the receiver; and

a third digital portion being defined as an action code, the action code being processible by the receiver if the destination identifier is as expected by the receiver and the source identifier is a member of a set of source identifiers recognized by the receiver.

64. A method for communicating lost encoded signals transmitted by a transmitter and received by a transceiver to find the transmitter that transmits information related to yarding operations, comprising:

transmitting by the transmitter a lost encoded signal that contains at least three digital portions, a first portion of the at least two digital portions being defined as a preamble, a second portion being defined as a network identifier, and a third portion being defined as a device identifier; and

processing the network identifier by the transceiver upon receiving the at least three digital portions to locate the lost transmitter when the preamble is of a predetermined pattern, and processing the device identifier to identify the lost transmitter when the transceiver recognizes the network identifier.

65. The method of Claim 64, wherein processing includes processing the network identifier having a source node identifier and a transceiver node identifier, the transceiver being programmed to recognize a predetermined transceiver node identifier and a set of source node identifiers, the act of receiving including discarding the encoded signal when either the source node identifier is not a member of the set of source node identifiers or the transceiver node identifier is different from the predetermined transceiver node identifier, thereby inhibiting unauthorized signals from interfering with the process for finding the lost transmitter.

66. The method of Claim 65, wherein the lost encoded signal includes a fourth portion that contains a sync, thereby allowing the transceiver to recognize a transition from the preamble to the rest of the lost encoded signal.

67. The method of Claim 66, wherein the lost encoded signal includes a fifth portion containing the first quantity that is indicative of the position of the transmitter along the horizontal plane and a sixth portion containing the second quantity that is indicative of the position of the transmitter along a vertical plane, thereby allowing the transceiver to derive the orientation of the transmitter.

68. The method of Claim 67, wherein the lost encoded signal includes a seventh portion containing a duration of time that the transmitter has laid motionless.

69. The method of Claim 68, wherein the lost encoded signal includes an eighth portion containing a level of a battery of the transmitter, the battery level being indicative of the remaining level of energy of the battery of the transmitter, thereby allowing the transceiver to calculate the remaining time the transmitter may operate.

70. A signal for carrying information to find a transmitter that transmits information related to yarding operations, the signal being transmitted by the transmitter and being received by a transceiver, the signal comprising:

a first digital portion being defined as a preamble that contains a first bit pattern;

a second digital portion being defined as a sync that contains a second bit pattern;

a third digital portion being defined as a network identifier that has a source identifier and a transceiver identifier, the network identifier being processible by the transceiver if the first bit pattern of the preamble and the second bit pattern of the sync are as expected by the transceiver.

71. The signal of Claim 70, further comprising a fourth digital portion being defined as a device identifier, the device identifier being processible by the transceiver if the transceiver identifier is as expected by the transceiver and the source identifier is a member of a set of source identifiers recognized by the transceiver.

72. The signal of Claim 71, further comprising a fifth digital portion being defined as a level of a battery of the transmitter, the battery level being indicative of the remaining level of energy of the battery of the transmitter, thereby allowing the transceiver to calculate the remaining time the transmitter may operate.

73. The signal of Claim 72, further comprising a sixth digital portion containing the first quantity that is indicative of the position of the transmitter along the horizontal plane.

74. The signal of Claim 73, further comprising a seventh portion containing the second quantity that is indicative of the position of the transmitter along a vertical plane, both the first quantity and the second quantity allowing the transceiver to derive the orientation of the transmitter.

75. The signal of Claim 74, further comprising an eighth portion containing a duration of time that the transmitter has laid motionless.